9-6
Solving Rational
Equations and Inequalities
and
Work Problems

Ex:

$$\frac{x^2+9}{x^2-3x+2}-\frac{6}{(x-1)}=\frac{2x}{(x-2)}$$

$(x-2)(x-1)$ $(x-1)(x-2)$

$x^2+9-6(x-2)=2x(x-1)$

$x^2+9-6x+12=2x^2-2x$

$0=x^2+4x-21$

$(x+7)(x-3)$

$x=-7 \quad x=3$

$\{-7,3\}$

Ex:

$$\frac{a}{2}-\frac{9-2a}{a-7}=\frac{5}{a-7}$$

$2(a-7)$

$a(a-7)-2(9-2a)=10$

$a^2-7a-18+4a=10$

$a^2-3a-28=0$

$(a-7)(a+4)$

$a=7$ $a=-4$

$\{-4\}$

Ex:

$$\frac{4}{5x}+\frac{1}{10}\leq\frac{3}{2x}$$

$10x$

$8+x=15$

$x=7$

$0<x\leq 7$

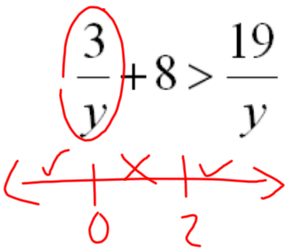
Check -1

$-.8+.1\leq -\frac{3}{2}$

$.8+.1\leq\frac{3}{2}$

$.08+.1\leq\frac{3}{20}$

Ex: $\frac{3}{y}+8>\frac{19}{y}$



$y<0$ OR $y>2$

Work Problems w = rt

1. It takes Sawyer 6 h and Jack 8 h to paint a room alone. How long would it take them to paint the room if they worked together?

rate = how much is done in 1 unit of time?

	r	t	W
S	$\frac{1}{6}$	t	$\frac{t}{6}$
J	$\frac{1}{8}$	t	$\frac{t}{8}$

$\left[\frac{t}{6}+\frac{t}{8}=1\right]24$

$7t=24$

$t=3\frac{3}{7}$ hrs

3. Working together, it takes Ben and John 16 h to tile a floor. It would take John 40h to do it alone. How long would it take Ben working alone?

	r	t	W
Ben	$\frac{1}{r}$	16	$\frac{16}{r}$
John	$\frac{1}{40}$	16	$\frac{16}{40}=\frac{2}{5}$

$5r\left[\frac{16}{r}+\frac{2}{5}=1\right]$ $80+2r=5r$ $80=3r$ $26\frac{2}{3}=r$ 26 hrs 40 min

HW

Work problems #s 5-9

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